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### REMARKS/ARGUMENTS

The Applicant has amended claims 3, 4, 5, 9, 10, 14, 18, 29, 33, 39, 42, 43, 47, 51, 52, 55. Please consider the following comments in light of the amendment provided above.

The Examiner has taken the position that claims 1 to 58 are anticipated by Yamamoto et al. ("Yamamoto") and that claims 1 to 28 and 30 to 58 are obvious with reference to Flynn et al ("Flynn") in light of Greeves ("Greeves"). As a general comment, the subject application is directed at providing a method for controlling the auto-ignition properties of a fuel in an engine that uses both directly injected fuel and pre-mixed fuel. No such combustion method is discussed in Yamamoto or Greeves, where each contemplates either a spark ignited system or a compression ignition system. Furthermore, in the subject disclosure while a post-ignition pressure in a combustion chamber is compared with pre-ignition pressure, there is no need to use the peak post-ignition pressure as is taught in Yamamoto and Greeves. In fact the subject application teaches a method that avoids using peak cylinder pressure to control combustion in the engine.

Referring specifically to the independent claims objected to by the Examiner, Claims 1, 29 (as amended) and 47, each have elements that are not disclosed in any of the cited art. Claim 1 in the subject application includes the following elements, which are not disclosed or suggested in Yamamoto or Greeves:

- introducing a first quantity of said fuel into said combustion chamber during said intake event or a compression event of said cycle, and directly injecting a second quantity of said fuel into said combustion chamber when said piston is near top dead center
- calculating an estimated SOC of said first quantity of said fuel within said combustion chamber from said pre-combustion sensor signal and said first post-ignition sensor signal

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Neither Yamamoto nor Greeves discuss an internal combustion engine wherein two separate introductions of fuel are provided into the combustion chamber within a single cycle of the engine. As well, there is no contemplation of any introduction of a fuel into the combustion chamber during the compression stroke or when the piston is near top dead center. Neither Yamamoto, Greeves nor Flynn discuss estimating start of combustion ("SOC") of the first quantity of fuel, as distinct from the second quantity of fuel, by reference to a pre-combustion sensor signal and a first post-ignition sensor signal. In this respect, the Examiner agreed that Flynn did not teach using both a pre-ignition pressure signal and a post-ignition pressure signal.

Claim 29, the second independent claim in the subject application, includes the following elements, neither of which are disclosed or suggested in Yamamoto, Flynn or Greeves:

- wherein said fuel comprises a pilot fuel and a first fuel, said pilot fuel being more auto-ignitable than said first fuel
- said engine comprising an injector and a manifold for introducing said fuel into said combustion chamber

The cited art does not teach a system that allows for the introduction of two fuels through an intake manifold and an injector where one of the fuels is more auto-ignitable than the other.

The last independent claim, Claim 47, includes the following elements, none of which are disclosed in Yamamoto or Greeves:

- introducing a first quantity of a pilot fuel into said combustion chamber
- wherein said first quantity of said main fuel, said first quantity of said pilot fuel and said intake charge are compressed and premixed into an auto-ignitable fuel/air charge at or near completion of said compression event
- directly injecting a second quantity of said main fuel into said combustion chamber when a piston partially defining said combustion chamber is near top dead center

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Neither Yamamoto nor Greeves discuss an internal combustion engine wherein two separate introductions of fuel are provided into the combustion chamber within a single cycle of the engine. As well, there is no contemplation of any introduction of a fuel into the combustion chamber during the compression stroke or when the piston is near top dead center. Neither Yamamoto, Greeves nor Flynn discuss estimating start of combustion ("SOC") of the first quantity of fuel, as distinct from the second quantity of fuel, by reference to a pre-combustion sensor signal and a first post-ignition sensor signal. In this respect, the Examiner agreed that Flynn did not teach using both a pre-ignition pressure signal and a post-ignition pressure signal.

Claim 29, the second independent claim in the subject application, includes the following elements, neither of which are disclosed or suggested in Yamamoto, Flynn or Greeves:

- wherein said fuel comprises a pilot fuel and a first fuel, said pilot fuel being more auto-ignitable than said first fuel
- said engine comprising an injector and a manifold for introducing said fuel into said combustion chamber

The cited art does not teach a system that allows for the introduction of two fuels through an intake manifold and an injector where one of the fuels is more auto-ignitable than the other.

The last independent claim, Claim 47, includes the following elements, none of which are disclosed in Yamamoto or Greeves:

- introducing a first quantity of a pilot fuel into said combustion chamber
- wherein said first quantity of said main fuel, said first quantity of said pilot fuel and said intake charge are compressed and premixed into an auto-ignitable fuel/air charge at or near completion of said compression event
- directly injecting a second quantity of said main fuel into said combustion chamber when a piston partially defining said combustion chamber is near top dead center

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- during a subsequent cycle of said engine, varying at least one of said first quantity of said pilot fuel, said pilot timing, said first quantity of said main fuel, if said estimated SOC of said auto-ignitable fuel/air charge is different than a predetermined target SOC of said auto-ignitable fuel/air charge

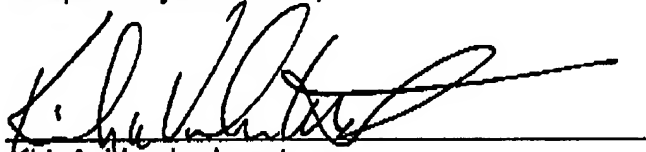
As noted above, neither Yamamoto nor Greeves disclose or suggest an internal combustion engine with two separate introductions of at least two fuels into a combustion chamber within a single cycle of an engine. Additionally, neither Yamamoto, Greeves nor Flynn discuss varying start of combustion within the combustion chamber by varying at least one of the first quantity of the pilot fuel, the pilot timing, the first quantity of said main fuel in an engine with at least two fuels.

In view of the above comments, this case is believed to be in condition for allowance. The Examiner is invited to telephone the applicants' undersigned attorney at (312) 775-8000 if any unresolved matters remain.

**Fee Payment and Authorization**

Please charge any fees due in connection with this submission and credit any overpayment to Deposit Account No. 13-0017.

Respectfully submitted,



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Date: April 11, 2005

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